

## Effect of Relative Humidity on Ammonia Volatilization from Broiler Litter

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Advanced Crop and Soil Sciences Seminar

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Miller Plant Sciences Building, Room 2401

Broiler litter is a great source of plant available N for pastures and crops. However, large losses of N to the atmosphere through ammonia volatilization can lead to lower crop yields and environmental contamination. Ammonia volatilization is dependent on many factors: manure management, soil characteristics, and environmental conditions. Relative humidity (RH) may play a large role in increased volatilization through the re-humidification of litter and increased mineralization of uric acid and urea leading to ammonia loss. Understanding the effect of relative humidity may help to explain high N loss and lead to more precise rate recommendations. The objectives of this study are to i) determine the effect of RH on litter water potential ii) determine the effect of litter water potential on decomposition of urea and uric acid conditions iii) create a model of ammonia volatilization from broiler litter, and iv) validate the model with laboratory and field studies. The effective of RH on litter water potential will be evaluated by placing litter samples with two sub-treatments of water content in sealed containers with relative humidity values ranging from high to low. The water potential of the litter will be measured at different equilibration times. Urea and uric acid degradation will be measured at various water potentials. Litter will be adjusted to water potentials ranging from low to high and will be spiked with a nonlimiting urea or uric acid concentration. Samples will then be measured for the degradation of urea or uric acid over time at each water potential. The information gathered will be used to develop a model of ammonia volatilization from broiler litter. This model will be validated with laboratory and field studies in which broiler litter will be applied at a rate of 200 kg total N ha<sup>-1</sup>. A weather station set up in the field will provide RH, temperature, and rainfall data for model input.

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